

xeric environment. In this case the adaptive response for this extreme might be observed in the tomentose pubescence of twigs and petioles, but otherwise there were no obvious differences.

These two varieties then increased the geographic distribution of the genus as a whole so that its present range includes most of central, east central, and south central North America. *C. canadensis* var. *typica* and the varieties *texensis* and *mexicana* are not too unlike to make such an explanation for their ranges plausible. And *C. occidentalis*, because of its isolation, would of course have been expected to evolve into a separate species morphologically unlike its relatives.

Regarding the glabrous form of *C. canadensis* it appears to be merely an ecological response and occurring as it does throughout the range of the typical form is worthy only of recognition as a form rather than as a variety.

The geographic distribution of the genus in America is illustrated by the accompanying maps.

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A NOTE ON *SAGITTARIA KURZIANA*

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When Glück¹ described his *Sagittaria Kurziana* he found no mature achenes on the plants collected. As a result his description lacks data concerning this fundamental structure. Small² also had no achenes of this species for study when he reduced it to synonymy. As a result the status of this form has been uncertain.

A number of plants of *S. Kurziana* were collected from the St. Marks river at Newport, west Florida, one of the stations where Glück collected type material. Achenes were obtained from one of the plants growing in a green-house pool as the result of crossing one of its pistillate flowers with pollen from a plant of *S. stagnorum* Small. As there were no staminate flowers of *S. Kurziana* in bloom at the time this was the only source of likely pollen and so was used. The resulting mature achenes contained

¹ Glück, Hugo. 1927. Bull. Torr. Bot. Club 54: 257-261.

² Small, J. K. 1933. Manual of the Southeastern Flora, p. 24.

viable seeds and a number of healthy hybrid plants were obtained. Some achenes were dried and added to herbarium specimens of the pistillate plant. There may be some question as to whether the form and shape of the achenes produced by the above cross are affected by the pollen. In cases where the shape of the fruit is affected by the pollen the effect is indirect. Pollen does affect the endosperm and embryo so that changes in these structures may modify the form of the fruit, as in corn. In *Sagittaria*, however, there is no endosperm and the embryos of all species are of about the same shape. The characteristic form of these achenes is due to outgrowths of the fruit, crests and beak. There is little probability that these are modified by the

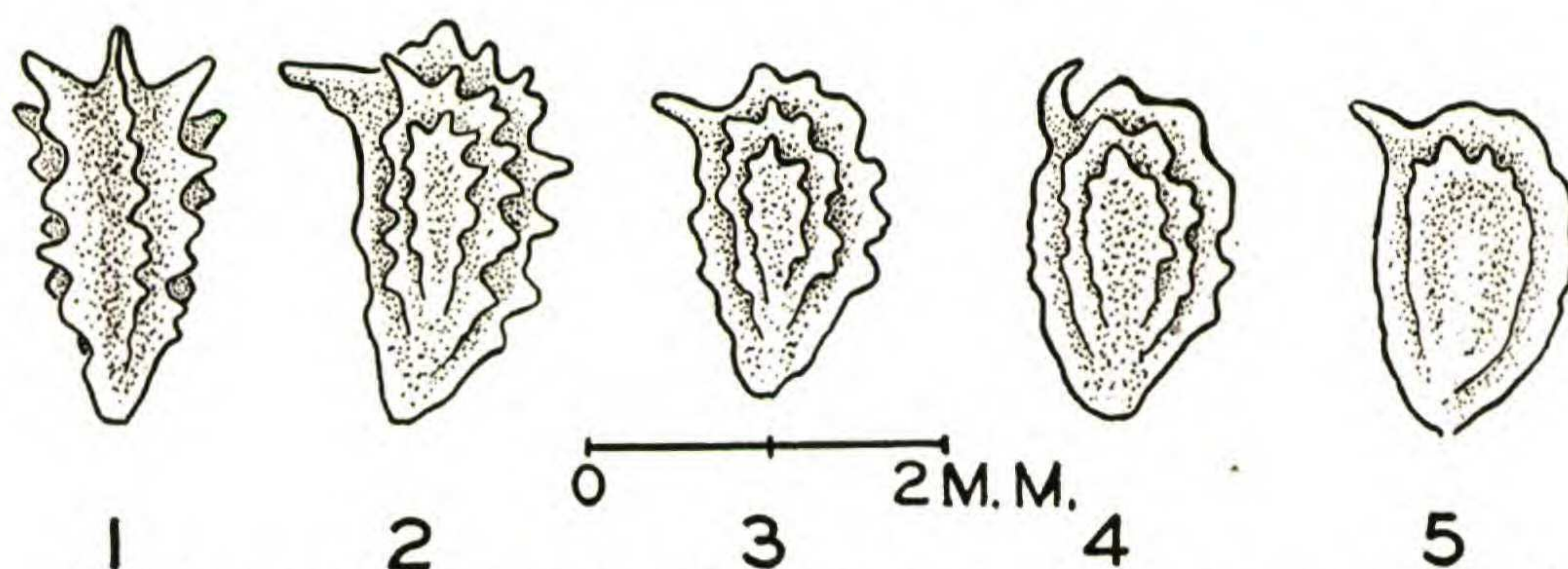


FIG. 1, Back view of achene of *S. KURZIANA*; FIG. 2, side view of same; FIG. 3, side view of achene of *S. LORATA*; FIG. 4, side view of achene of *S. STAGNORUM*; FIG. 5, side view of achene of *S. SUBULATA*.

pollen of a different species if mature embryos are formed as was true in this case. A description of these achenes follows.

Pistillate flowers recurving soon after pollination; fruit developing, maturing, and separating from the receptacle under water; fruiting heads 10–12 mm. in diameter, nearly spherical; receptacle obovoid, 6–7 mm. long, 3–4 mm. in diameter; *achene* 2.5–3.0 mm. long, *crests* 5, deeply indented, appearing spiny, *beak* about 0.4 mm. long, straight, horizontal to slightly inclined.

This species is closely related to *S. stagnorum* Small, *S. lorata* (Chapm.) Small, and *S. subulata* (L.) Buch. Fernald¹ has recently revised part of this group, considering *S. lorata* and *S. stagnorum* (*S. natans* Michx. not Pall.) as varieties of *S. subulata*. *S. Kurziana* differs from these other three species both vegetatively as Glück has shown and as to achene characters. Differ-

¹ Fernald, M. L. 1940. RHODORA 42: 408–409.

ences in the achenes of these forms are shown in FIGS. 1 to 5. The status of *S. Kurziana* should be equal to any of these other three forms, whether of specific or varietal rank.

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REPORTS ON THE FLORA OF MASSACHUSETTS—III.

OWING to the extremely technical character of most of the species included in the present report, it has been necessary to disregard many records in local floras and rely for the most part on actual specimens or on recent monographic works, notably Prof. Fernald's "The Linear-leaved North American species of *Potamogeton*, Section *Axillares*." Incidentally the sequence of species in *Potamogeton* used here follows that given on page 29 of his monograph.

In cases where the persistence of a species in a given locality is open to doubt, the latest date of collection is noted. There are quite a number of these "fossil" records, particularly in the vicinity of Boston, and it will be interesting to see if any of them can be rediscovered after sixty or seventy years of oblivion.

One very complete massacre of the flora should be noted in the construction of the Quabbin Reservoir for the Metropolitan Water Supply. Because of its inundation of the Swift River Valley near the junction of Franklin, Hampshire and Worcester Counties, stations for all but complete aquatics must be considered obliterated in practically all of Enfield and Greenwich and large parts of Prescott, New Salem, Dana, Pelham and Belchertown.

TYPHACEAE (CAT-TAIL FAMILY)

TYPHA L. CAT-TAIL, FLAG.

T. latifolia L. Common Cat-tail. Marshes; common throughout.

Forma **ambigua** (Sonder) Holmb. in Hartmans Handb. Scand. Fl. ed. 12, i. 70 (1922); cf. also RHODORA, xxix. 249, 251 (1927). Rare over the same range as the species.

T. angustifolia L. Marshes; frequent along the coast, rare inland.